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(54) Title: A CONFOCAL MICROSCOPE SYSTEM FOR REAL-TIME SIMULTANEOUS TEMPORAL MEASUREMENTS OF METACHRONAL WAVE PERIOD AND CILIARY BEAT FREQUENCY

(57) Abstract: The present invention relates to a method and system that enables continuous real-time analysis of both ciliary beat frequency and metachronal wave frequency from a single spot in excised native ciliated epithelial tissues as well as in primary and subsequent epithelial cultures. Such method and system utilizes the concept of time-scale wavelet analysis and Hilbert Transformation for backscattered light derived from a confocal (conjugate) spot on the moving cilia. This light contains inherent high and low frequency components corresponding to CBF and MWF.